Complete Summary

GUIDELINE TITLE

Ottawa Panel evidence-based clinical practice guidelines for therapeutic exercises and manual therapy in the management of osteoarthritis.

BIBLIOGRAPHIC SOURCE(S)

Ottawa panel evidence-based clinical practice guidelines for therapeutic exercises and manual therapy in the management of osteoarthritis. Phys Ther 2005 Sep;85(9):907-71. [178 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Osteoarthritis

GUIDELINE CATEGORY

Management
Rehabilitation
Treatment

CLINICAL SPECIALTY

Family Practice
Internal Medicine

Physical Medicine and Rehabilitation
Rheumatology

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Nurses
Occupational Therapists
Patients
Physical Therapists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To advance proper use of therapeutic exercises and manual therapy in the management of patients with osteoarthritis

TARGET POPULATION

Adult patients (>18 years of age) with a diagnosis of osteoarthritis (OA)

Excluded groups include patients who had recent surgery or other rheumatologic, musculoskeletal, or spinal problems or subjects without known pathology or impairments.

INTERVENTIONS AND PRACTICES CONSIDERED

1. Strengthening exercises including:
    - Lower-extremity (LE) strengthening
    - LE isometric strengthening
    - Isotonic resistance training
    - Isotonic combined with isokinetic resistance training
    - Eccentric resistance training
    - Concentric resistance training
    - Concentric-eccentric resistance training
    - Home strengthening program
    - General LE exercise program
    - Progression versus no-progression LE strengthening
    - Hand strengthening
2. General physical activity including:
    - Whole-body functional exercise
    - Walking program
    - Jogging in water
    - Water exercises
    - Yoga
3. Manual therapy combined with exercise

MAJOR OUTCOMES CONSIDERED

- Pain
- Functional status
- Patient global assessment
- Quality of life
- Return to work

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

For this project the Ottawa Panel used the same methods as those of a previous study on therapeutic exercise for patients with rheumatoid arthritis. Details of the literature search strategy are in Appendix 3 of the original guideline document.

Study Selection

Studies of adult patients (>18 years of age) with classical or definite osteoarthritis (OA) as defined by Klippel et al were included in the literature search. Patients with OA that affected peripheral joints were eligible to participate. Patients at different stages of the disease participated in the included clinical trials; some trials involved patients with both chronic and acute conditions. All stages of the disease were included in the analysis. Most trials involved patients with chronic OA (>12 years' duration).

Various exclusion criteria were established:

- Studies of patients with OA involving spinal problems (excluded due to the numerous associated signs and symptoms and because the Philadelphia Panel guidelines for low back pain and neck pain were recently developed by the same methodologists)
- Studies of patients who recently had surgery
- Patients with other rheumatologic or musculoskeletal problems (e.g., fractures, tendinitis, or bursitis), clinically important medical problems, or psychiatric conditions that could hamper rehabilitation or reduce functional status
- Studies of subjects without known pathology or impairments
- Studies of subjects with mixed arthritic conditions such as the sample in a study by D'Lima et al.

Table 1 in the original guideline document lists the complete inclusion and exclusion criteria.

Study Inclusion/Exclusion Criteria

Generally, comparisons of 2 active interventions (head-to-head studies) were excluded for the same reasons explained in the previous publication on the

Ottawa Panel evidence-based clinical practice guidelines (EBCPGs) on rheumatoid arthritis (RA). Examples of head-to-head studies include dynamic exercises versus isometric exercises, individual versus group exercises, home exercises versus aquatics, walking versus patient education, sham electrical stimulation versus patient education combined with therapeutic exercises (TE), aerobics (walking) versus strengthening exercises, and walking versus jogging in water. Some studies had several comparative groups, and only some of the group comparisons were eligible to be included.

Other excluded interventions comprised surgery, drug, or psychosocial (nonphysical) interventions. For instance, the randomized controlled trials (RCTs) on exercises after a total hip replacement for severe hip OA were excluded; RCTs with frequent use of continuous passive motion (CPM) following a total knee arthroplasty for severe knee OA also were excluded. However, practitioners can refer to a recent meta-analysis on the efficacy of continuous passive motion combined with physical therapy versus physical therapy alone (n=799) following a total knee arthroplasty for knee OA to find further recommendations on these postsurgery interventions (grade A for flexion deformity and time to achieve 90 degrees of flexion and grade C+ for active knee flexion range of motion [ROM], pain related to analgesic use, and number of patients needing postoperative manual therapy). Postsurgery intervention studies usually allowed samples with varying proportions of patients with OA and rheumatoid arthritis. Most of the RCTs on efficacy of postsurgery interventions such as continuous passive motion recruited subjects with mixed arthritic conditions, which is the reason they are excluded in this article.

Subjects who received placebo, were untreated, or received routine conventional therapeutic approaches were acceptable control groups. If concurrent interventions (e.g., electroanalgesia and medication) were provided to the experimental and control groups, these interventions were included. However, interventions where the patient acts as his or her own control were not included. A priori, the guideline developers did not include or exclude studies based on the quality of their methods. However, they did consider quality when grading their recommendations.

The categories of interventions selected were approved by the Ottawa Panel according to the study's description of the intervention. Category selection also was influenced by previous work performed by the Ottawa Methods Group and by the Ottawa Panel on therapeutic exercises for patients with rheumatoid arthritis.

Results of Literature Search

Through a literature search, 609 potential articles on therapeutic exercises and manual therapy for OA were identified. Based on the selection criteria checklist, 113 studies were potentially relevant; 26 of these studies were ultimately included. One of the 26 studies had a follow-up study, so we have counted these 2 studies as one, using the number of patients in the original study when calculating patient numbers. The other trials were excluded for various reasons. The search identified 31 articles on manual therapy, 3 of which were initially seen as relevant. Only one article was included.

NUMBER OF SOURCE DOCUMENTS

26 randomized controlled trials and controlled clinical trials met the selection criteria and were included.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus
Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The methodological quality of the trials was assessed using the Jadad scale, a 5-point scale with reported reliability and validity that assigns 2 points each for randomization and double blinding and 1 point for description of withdrawals.

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Evidence from randomized controlled trials (RCTs) and observational studies were identified and synthesized using methods defined by the Cochrane Collaboration that minimize bias by using a systematic approach to literature search, study selection, data extraction, and data synthesis.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

At the start of the osteoarthritis (OA) project, the guideline authors defined an a priori protocol that was used for separate systematic reviews of trials relating to each intervention. The strength of evidence was graded as level I for randomized controlled trials (RCTs) or level II for nonrandomized studies. An expert panel developed a set of criteria for grading the strength of both the evidence and the recommendation. The Ottawa Panel decided that evidence of clinically important benefit (defined as a difference of more than 15% relative to a control based on panel expertise and empiric results) in patient-important outcomes was required for a recommendation. Statistical significance also was required but was insufficient alone. Patient-important outcomes were decided by consensus as being pain, functional status, patient global assessment (defined as "patient's assessment of overall disease activity or improvement"), quality of life, and return to work, providing that these outcomes were assessed with a validated scale that yields reliable data.

The guideline authors determined that it was not possible to pool data to develop the guidelines. Each statement of recommendation represents one trial for a specific intervention (in terms of session/treatment duration and frequency) for a specific clinical outcome and a specific period of time. The included studies were gathered into general (i.e., strengthening, general physical activity, combination of exercises) and more specific (e.g., isometric, isotonic, isokinetic, eccentric, concentric, aerobic) types of therapeutic exercises (TE) according to the description by the trial investigators. The reader needs to refer to the tables of included studies in the original guideline document to find more details about the characteristics of the therapeutic application of a specific therapeutic exercise included in the guidelines.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The recommendations were graded by their level (I for randomized controlled trials [RCTs], II for nonrandomized studies) and strength (A, B, C+, C, or D) of evidence.

Grade A: Evidence from one or more RCTs of a statistically significant, clinically important benefit (>15%)

Grade B: Statistically significant, clinically important benefit (>15%) if the evidence was from observational studies or controlled clinical trials (CCTs)

Grade C+: Evidence of clinical importance (>15%) but not statistical significance

Grade C: An appropriate outcome was measured in a study that met the inclusion criteria but no clinically important difference and no statistical significance were shown.

Grade D: Evidence from one or more RCTs of a statistically significant benefit favoring the control group (<0%: favors controls)

COST ANALYSIS

A published cost analysis was reviewed.

METHOD OF GUIDELINE VALIDATION

Comparison with Guidelines from Other Groups
External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Each recommendation is followed by recommendation grades (Level I or II and A, B, C+, C and D). Definitions of the recommendation grades are presented at the end of the "Major Recommendations" field.

Note: The recommendations state the disease stage for which the intervention is most appropriate. If, however, the trial on which the recommendation was based did not mention disease stage, neither does the recommendation (see Appendix 2 in the original guideline document for more information).

Strengthening Exercises

Lower-extremity (LE) strengthening versus control, level 1 (randomized controlled trial [RCT], n=345): grade A for pain getting up from floor and functional status (clinically important benefit); grade C+ for pain during walking, pain while climbing stairs, functional tasks, and quadriceps femoris muscle peak torque (clinical benefit); grade C for stiffness, mobility, quadriceps femoris muscle force, muscle activation, and quality of life (no benefit). Patients with a diagnosis of osteoarthritis (OA) of the knee.

Lower-extremity isometric strengthening versus control, level 1 (RCT, n=102): grade A for pain getting down to and up from floor (clinically important benefit); grade C+ for pain getting down and up stairs and timed functional tasks (clinical benefit); grade C for stiffness and functional status (no benefit). Patients with a diagnosis of OA of the knee.

Isotonic resistance training versus isotonic combined with isokinetic (Kinetron) resistance training for knee, level 1 (RCT, n=32): grade C for quadriceps femoris muscle peak torque (no benefit). Patients with a primary diagnosis of OA of the knee.

Isotonic combined with isokinetic (Kinetron) resistance training for knee versus control, level 1 (RCT, n=32): grade C for muscle force (no benefit). Patients with primary diagnosis of OA of the knee.

Eccentric resistance training (Cybex) for knee versus control, level 1 (RCT, n=32): grade C for muscle force (no benefit). Patients with primary diagnosis of OA of the knee.

Concentric resistance training for knee versus control, level 1 (RCT, n=23): grade A for pain at rest and during activities (clinically important benefit); grade C for global functional status (no benefit). Patients with knee OA bilaterally and grade II or III OA.

Concentric-eccentric resistance training for knee versus control, level 1 (RCT, n=23): grade A for pain at rest and during specific functional activities: 15-m walk and stair climbing/descending time (clinically important benefit). Patients with knee OA bilaterally and grade II or III OA.

Home program strengthening for knee versus control, level 1 (controlled clinical trial [CCT], n=81): grade A for pain, functional status, energy level, and range of motion (ROM) in flexion (clinically important benefit); grade C for physical

mobility, muscle force, swelling, and exercise (no benefit). Patients with OA of the knee.

General LE exercise program (including muscle force, flexibility, and mobility/coordination) versus control, level 1 (RCT, n=490): grade A for pain at night and ability on stairs (clinically important benefit); grade C for knee flexion ROM, muscle force, knee joint position, gait, functional status, quality of life, muscle activation, stiffness, and physical activity (no benefit). Patients with a diagnosis of OA.

Progression versus no-progression LE strengthening exercises, level 1 (RCT, n=179): grade A for pain at rest and ROM (clinically important benefit); grade C for stiffness and functional status (no benefit). Patients with radiographic evidence of OA in the tibiofemoral compartment.

Hand strengthening versus control, level 1 (RCT, n=40): grade A for pain and grip force (clinically important benefit). Patients who met the American College of Rheumatology criteria for hand OA. (Altman et al., 1990)

General Physical Activity, Including Fitness and Aerobic Exercises

Whole-body functional exercise versus control, level 1 (RCT, n=864): grade A for pain and functional status (mobility, walking, work, disability in activities of daily living [ADL]) (clinically important benefit); grade C for knee flexor ROM, quadriceps femoris muscle force, hamstring muscle force, gait, and quality of life (no benefit). Patients with OA of the knee.

Walking program versus control, level 1 (RCT, n=1,089): grade A for pain, functional status, stride length, disability transferring from bed, disability bathing, aerobic capacity, energy level, and medication use (clinically important benefit); grade C+ for disability in ADL (clinical benefit); grade C for walking speed, disability toileting, disability dressing, blood pressure, morning stiffness, and quality of life (no benefit). Patients with OA.

Jogging in water versus control, level 1 (RCT, n=115): grade A for physical activity and aerobic capacity (clinically important benefit); grade C for morning stiffness, pain, grip force, trunk ROM, functional status, and exercise endurance (no benefit). Patients with current symptoms of chronic pain and stiffness in involved weight-bearing joints.

Water exercises versus control, level 1 (RCT, n=30): grade C for torque and ROM (no benefit). Patients with OA or rheumatoid arthritis (RA) diagnosed by a rheumatologist or an orthopedic physician.

Yoga versus control, level 1 (RCT, n=30): grade A for pain during activity and ROM (clinically important benefit); grade C for tenderness, muscle force, swelling, and hand function (no benefit). Patients with OA of the distal interphalangeal or proximal interphalangeal joints of the fingers.

Combination of Exercises

Manual therapy combined with exercise versus control, level 1 (RCT, n=83): grade A for pain (clinically important benefit); grade C for functional status (no benefit). Patients with a diagnosis of OA.

Definitions:

The recommendations were graded by their level (I for RCTs, II for nonrandomized studies) and strength (A, B, C+, C, or D) of evidence.

Grade A: Evidence from one or more RCTs of a statistically significant, clinically important benefit (>15%)

Grade B: Statistically significant, clinically important benefit (>15%) if the evidence was from observational studies or CCTs

Grade C+: Evidence of clinical importance (>15%) but not statistical significance

Grade C: An appropriate outcome was measured in a study that met the inclusion criteria but no clinically important difference and no statistical significance were shown

Grade D: Evidence from one or more RCTs of a statistically significant benefit favoring the control group (<0%: favors controls.)

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

The Ottawa Panel concluded that therapeutic exercise is beneficial for patients with osteoarthritis. Benefits are recognized for pain at rest and during functional activities, knee range of motion, quadriceps femoris muscle peak torque, grip force, stride length, level of energy, functional status, and aerobic capacity. Quality of life also was enhanced (statistical significance only) after an 8-week

lower extremity strengthening exercise program and 18 months after a walking program.

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

These recommendations are limited by methodological considerations, such as the relatively good quality, but generally poorly reported description, of therapeutic exercise programs and the selection of outcomes of the included primary trials.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Ottawa panel evidence-based clinical practice guidelines for therapeutic exercises and manual therapy in the management of osteoarthritis. Phys Ther 2005 Sep;85(9):907-71. [178 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2005 Sep

GUIDELINE DEVELOPER(S)

Ottawa Panel - Independent Expert Panel

SOURCE(S) OF FUNDING

This study was financially supported by The Arthritis Society (Canada) (Grant TAS-319); the Ontario Ministry of Health and Long-Term Care (Canada) (Grant HRPD-05225); the Career Scientist Salary Support Program (HRPD-05225).

GUIDELINE COMMITTEE

Ottawa Panel

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Physical Therapy journal Web site.

Print copies: Available from Lucie Brosseau, PhD, Physiotherapy Program, School of Rehabilitation Sciences, Faculty of Health Sciences, 451 Smyth Rd, University of Ottawa, Ottawa, Ontario, Canada K1H 8M5 (E-mail: LucieBrosseau@uottawa.ca).

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on September 28, 2005. The information was verified by the guideline developer on October 6, 2005.

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